



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/577,340	05/24/2000	Hiroaki Takebe	826.1605/JDH	5834
21171	7590	01/29/2004	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			LU, TOM Y	
			ART UNIT	PAPER NUMBER
			2621	11

DATE MAILED: 01/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/577,340

Applicant(s)

TAKEBE ET AL.

Examiner

Tom Y Lu

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/03/2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 18 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22 and 23 is/are allowed.
- 6) ☒ Claim(s) 1-21 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 April 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- ☐ Interview Summary (PTO-413) Paper No(s). _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The amendment and written response filed on November 03, 2003 has been entered.
2. Claim 18 has been withdrawn.
3. Claims 22-24 have been added.
4. Claims 1-24 are pending.

Response to Arguments

5. Applicant's arguments filed on November 03, 2003 have been fully considered but they are not persuasive.

The Kamitani reference:

Applicant argues Kamitani does not teach or suggest comparing a feature amount of an image and a feature amount of a category as occurs in the feature amount comparison unit of the present invention as indicated in several independent claims. In addition, applicant argues, Kamitani fails to teach the comparison unit generates a correspondence relationship between the category feature amount and the image feature amount. It is submitted that the feature amount comparisons of the applicant's invention are not taught or suggested in Kamitani.

Upon further review of specification, and in light of applicant's arguments, the examiner respectfully disagrees for the following reasons. First of all, Kamitani discloses the limitation of "comparing with the feature amount of the category with the feature amount of the image". Kamitani at column 3, lines 56-57, teaches a partial pattern dictionary 122 for storing partial patterns which become features for specifying the character font. The pattern dictionary herein is interpreted as claimed "category", and the partial patterns are the claimed "feature amount".

Art Unit: 2621

Kamitani later at column 5, lines 7-12, teaches the image of a character string and the partial pattern are both being read into detecting unit 121 to compute the degree of coincidence. The image of a character string is the claimed "feature amount of the image", and the computation of degree of coincidence corresponds to the claimed "comparison". As a result, the limitation of "comparing the feature amount of the category with the feature amount of the image" is satisfied. Moreover, computation of degree of coincidence represents the correspondence relationship between the category feature amount and the image feature amount, which is self-explanatory.

The Tanaka reference:

Applicant argues since Kamitani does not teach or suggest using a feature amount to improve extraction. Tanaka adds noting to Kamitani concerning featuring extraction using feature amounts. In addition, Tanaka discloses shifting the extraction position to the immediately previous adjacent extraction position when the next area cannot be segmented. This is in contrast to the present invention of the claim 15 that adjusts the current of first segmentation area.

Upon further review of specification, and in light of applicant's arguments, the examiner respectfully disagrees for the following reasons. With regard to the Kamitani reference, the examiner already provided explanation in the paragraph above. As admitted by the applicant, Tanaka teaches shifting the extraction position to the immediately previous adjacent extraction position when the next area cannot be segmented, which is precisely what the claim calls for, "changing the first segmentation area when a second segmentation area cannot be segmented". If the applicant is arguing about the succeeding limitation of "corresponding to a feature amount of a category from remaining areas of the image", the examiner would like to direct applicant's attention to figure 21, block 504, where Tanaka's system includes a step of computing similarity,

Art Unit: 2621

which determines whether or not the character is about to be segmented is a complete character, such similar step can also be found in Kamitani, which uses a partial pattern dictionary to provide partial patterns upon segmentation/extraction. Such similarity computation reveals the remaining area of numeral 503 as shown in figure 22C.

Upon entry of the amendments, 35 U.S.C. 112, 2nd paragraph rejection of claims 3, 5-10, 17 and 21 has been withdrawn.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 5-10 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

- a. With regard to Claim 5, the claim calls for a relating unit relating a last element of the sequence of the elements of the category to each of the sequence of elements of the character string image and relating each element linked to the last of the sequence of elements of the category to the element related to the last of the sequence of elements of the category or any element linked to the element related to the last of the sequence of elements of the category. Such unit is nowhere to found in the specification, nor is shown in drawing figures.

Art Unit: 2621

- b. Claims 6-10 are rejected as being dependent upon Claim 5.
- c. Claim 21 is rejected to for containing same missing subject matter described in Claim 5.

Drawings

7. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “relating unit” and “relating means” in Claims 5 and 21 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-8, 11-14, 16-21 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Kamitani (U.S. Patent No. 6,327,385 B1).

- a. As applied to Claim 20, which is representative of Claim 1, Kamitani discloses feature amount extraction means for extracting a feature amount of an image (Kamitani at column 2, lines 7-9, discloses a partial pattern detecting unit 121 as

Art Unit: 2621

shown in figure 1 for extracting areas coincident with the partial patterns from the image of the character string. A partial pattern detecting unit 121 corresponds to the claimed “feature amount extraction means”. The areas, which is consisted of pixels as shown in figure 5, coincident with the partial patterns corresponds the claimed “feature amount”); feature amount setting means for setting feature amount of a category (Feature extraction inhibited area dictionary 132 shown in figure 1 corresponds to the claimed feature amount setting means); feature amount comparison means for comparing the feature amount of the category with the feature amount of the image (detecting unit 121 is the claimed “comparison means”, see explanation in Paragraph 5 above); and segmentation means for segmenting a portion corresponding to the feature amount of the category from the image based on the comparison result (Character boundary portion detecting unit 134 in figure 1 corresponds to the claimed “segmentation means”, column 2, lines 23-25).

- b. Referring to Claim 2, Kamitani discloses wherein said feature amount comparison unit comprises a correspondence generation unit generating correspondence relationship between the feature amount of the category and the feature amount of the image, and compares the feature amount of the category with the feature amount of the image (Kamitani at column 5, lines 15-24, discloses calculating the degree of coincidence between the partial pattern and the image of character string).

- c. Referring to Claim 3, Kamitani discloses a difference level computation unit computing a difference in level between the feature amount of the category and the feature amount of the image, which are related by the correspondence relationship (column 5, lines 15-24); and an optimum correspondence extraction unit extracting optimum correspondence relationships each of which indicating a lowest difference level from the correspondence relationships, wherein said segmentation unit segments an ear corresponding to positions in which the difference level of the optimum correspondence relationship is equal to or lower than a predetermined value from the image (Kamitani at column 6, lines 50-54, discloses when the degree of coincidence is larger or equal to a predetermined threshold, the character has serif. In addition, Kamitani at column 7, lines 28-30, discloses when the font of characters constituting the string is determined as one having serif, the masking is performed for the objective picture prior to the procedures for obtaining the character separating feature).
- d. As applied to Claim 4, which is representative of Claim 14, Kamitani discloses a combination unit generating a combination of segmentation areas that are segmented from the image in such a way that areas similar to a feature amount of any categories may be adjacently connected to each other on the image; and a segmentation area determination unit determining a segmentation area of the image by prioritizing a combination in which a value obtained by accumulating each difference level for the corresponding category in each segmentation area of the combination of segmentation area is the smaller of the combinations

(Kamitani teaches partial pattern detector unit 121 calculates the degree of coincidence for each of the characters in the image of character string by overlapping the partial patterns from partial pattern dictionary 122 over the image of character string. Therefore, it is inherently true that the dictionary recognizes all the segmented characters).

- e. As applied to Claim 5, which is representative of Claim 21, Kamitani discloses a feature amount extraction unit extracting a feature amount of a character string image as a sequence of elements in a character string array direction (Kamitani at column 5, lines 7-8, discloses the image of a character string stored in the image storing unit 110 is read into the partial pattern detecting unit 121 as shown in figure 1. In addition, Kamitani at column 2, lines 7-9, discloses a partial pattern detecting unit 121 as shown in figure 1 for extracting areas coincident with the partial patterns from the image of the character string. A partial pattern detecting unit 121 corresponds to the claimed “feature amount extraction means”. The areas coincident with the partial patterns corresponds the claimed “feature amount”. The elements are the pixels as shown in figure 5. Moreover, Kamitani at column 5, line 21, discloses the direction is from left to right); a feature amount setting unit setting a feature amount of a category as a sequence of elements in a category array direction (Kamitani at column 5, lines 10 discloses partial pattern stored in the partial pattern dictionary is read in the partial pattern detecting unit 121. the partial pattern detecting unit 121 corresponds to the claimed “feature amount setting unit”. In addition, at column 6, lines 30-31, Kamitani teaches the direction

is from left to right as well since the reference coordinates start from (1,8) to (8,8) to (13,8)); a relating unit relating a last element of the sequence of the elements of the category to each of the sequence of element of the character string image and relating each element linked to the last of the sequence of elements of the category to the element related to the last of the sequence of element of the category or any element linked to the element related to the last of the sequence of elements of the category (Kamitani at column 5, lines 12-24, discloses the overlapping process between the image character string and the partial patterns, which is done by shifting the partial patterns from left to right, pixel by pixel); a search unit searching for an element of the character string image relating to the first element of the sequence of elements of the category in each of the sequence of elements of the image, to which the last of the sequence of the elements of the category is related (column 5, lines 12-24); a difference level computation unit computing a difference level in a feature amount between the character string image and the category, whose sequence of elements are related to each other (Kamitani at column 6, lines 24-33, discloses the degree of coincidence is obtained based on the overlapping process between the partial pattern and the image of character string as described at column 5, lines 12-24. The degree of coincidence corresponds to the claimed "difference level"); and a discrimination unit discriminating a segmentation position of a character from the character string image based on the difference level (Kamitani at column 6, lines 50-54, discloses when the degree of coincidence is larger or equal to a predetermined

threshold, the character has serif. In addition, Kamitani at column 7, lines 28-30, discloses when the font of characters constituting the string is determined as one having serif, the masking is performed for the objective picture prior to the procedures for obtaining the character separating feature).

- f. Referring to Claim 6, Kamitani discloses wherein said difference level is obtained from an accumulation result of a distance between elements from the first elements to the last element in the sequence of the elements of the category (column 5, lines 15-24, column 6, lines 24-33).
- g. Referring to Claim 7, Kamitani discloses wherein said search unit makes a correspondence relationship of a current element in the correspondence relationship of past elements based on the correspondence relationship indicating the smallest accumulation value of the distance between elements (Column 6, lines 33-37).
- h. Referring to Claim 8, Kamitani discloses an entry unit entering a set of a searched element of the character string image that is related to the first element of the sequence of elements of the category and a corresponding difference level each category to be recognized, for each of the sequence of elements of the image which is related to the last of the sequence of elements of the category (Column 5, lines 7-8, 21); a search unit searching for a difference level whose value is equal to or smaller than a predetermined value of difference levels specified by an element corresponding to the segmentation position of the character string image (column 6, lines 3-6); an acquisition unit obtaining the element of the character

string image corresponding to the difference level searched by search unit from said entry unit; and a computation unit computing a subsequent segmentation position of the character string image based on the element of the character string image obtained by said entry unit (column 6, lines 10-18).

- i. With regard to Claim 11, the only difference between Claim 11 and Claim 1 is Claim 11 calls for additional limitation of “generating an arbitrary correspondence relationship between the feature amount of the category and the feature of the image”, and such limitation is addressed in Claim 2.
- j. Referring to Claim 12, Kamitani discloses wherein said feature amount of the category is compared with the entire feature amount of the image in a continuous DP method (column 5, lines 15-24).
- k. Referring to Claim 13, Kamitani discloses wherein said feature amount is peripheral features up to an n-th peripheral feature (Kamitani teaches the pixel area shown in figure 5 as claimed “peripheral feature”).
- l. With regarding to Claim 16, the only difference between Claim 16 and Claim 5 is Claim 16 calls for an additional limitation of “scanning first and last elements in a sequence of elements of the category independently of the sequence of the elements of the character string image”, such feature is taught by Kamitani in figure 4-7, where Kamitani suggests overlapping the partial pattern over the image of character string, and perform searching by shifting the pattern from left to right, such searching process corresponds to the claimed “scanning” process.

Art Unit: 2621

The reference points (1,8), (8,8), (13,8) described at column 6, lines 30-31 correspond to the claimed "elements".

- m. With regarding to Claim 17, the only difference between Claim 17 and Claim 11 is Claim 17 calls for an additional limitation of "determining the category used for the segmentation as a recognition result of the area segmented from the image." Kamitani at column 5, line 60, teaches the partial patterns are registerable in the dictionary, which implies the dictionary is updated as the new partial patterns become available.
- n. With regarding to Claim 19, the only difference between Claim 19 and Claim 11 is Claim 19 calls for an additional limitation of "a computer-readable storage medium storing a program", Kamitani teaches that at column 8, lines 11-14.
- o. With regard to Claim 24, all limitations are addressed in Claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- 9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamitani in view of Tanaka et al (U.S. Patent No. 5,684,891).

Referring to Claim 15, Kamitani discloses segmenting a first segmentation area corresponding to a feature amount of a category from an image (the explanation is provided in Claim 1). However, Kamitani does not teach changing the first segmentation area when a second

Art Unit: 2621

segmentation area cannot be segmented corresponding to a feature amount of a category from remaining areas of the image. Tanaka at column 22, lines 45-64, teaches block 503 is segmented as shown in figure 22C. However, the block 503 is actually only a part of a Japanese character as shown in figure 22D, which the system could not further segment the next character after block 503 as shown in figure 22C. Therefore, the system is changed the segmentation area for block 503 to 504 to completely segment the entire Japanese character. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to change the first segmentation area because the second segmentation area cannot be segmented. One of ordinary skill in the art would have been motivated to do this because Tanaka at column 22, lines 25-28, discloses "if the preceding computed segmentation exhibits results relatively better than the results of the present segmentation, it is judged to execute re-segmentation at the preceding determination" since some characters, such as Japanese and Chinese, are ideographic, and they are ensemble.

Allowable Subject Matter

10. Claims 9-10 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

11. Claims 22-23 are allowed.

The following is an examiner's statement of reasons for allowance:

- a. Independent Claim 22 defines features of a path generation unit generating a path connecting the segmentation position of the character string image with the next segmentation position of the character string image computed by said

Art Unit: 2621

computation unit; a combination generation unit generating a combination of the paths by trading the character string image through the path; an evaluation unit evaluating the combination of the paths based on an accumulation result of a difference level assigned to the path. These features in combination with other features in Claim 22, which is the broadest allowable claim, are not taught or suggested by the art of record.

b. Claim 23 is dependent upon Claim 22.

12. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

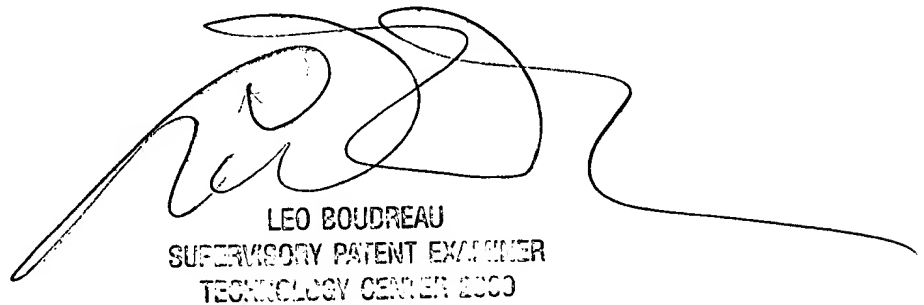
Art Unit: 2621

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom Y Lu whose telephone number is (703) 306-4057. The examiner can normally be reached on 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo H Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Tom Y. Lu



LEO BOUDREAU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2000